PAN-PACIFIC ENTOMOLOGIST
75(3): 165–169, (1999)

ESTABLISHMENT OF AN EXOTIC PLASTER BAGWORM IN CALIFORNIA (LEPIDOPTERA: TINEIDAE)

HANIF GULMAHAMAD
Terminix International, 1501 Harris Court, Anaheim, California 92806

Abstract.—This paper reports the first North American and California records of the plaster bagworm, *Phereoeca praecox* Gozmany and Vari. Distributional records for California are reported. A case history of *P. praecox* as a fabric pest in southern California is described. Food sources of *Phereoeca* are summarized. Dissection of live larval cases reveals that in southern California, *P. praecox* is essentially chitinophagous and keratinophagous.

Key Words.—Insecta, Lepidoptera, Tineidae, plaster bagworm, fabric pest, food sources, *Phereoeca praecox.*

The genus *Phereoeca* (Lepidoptera: Tineidae) was created in 1956 in order to separate a group of flat, case-bearing moths from case-making moths of the genus *Tineola* (Hinton & Bradley 1956). *Phereoeca* spp. are commonly referred to as wall bagworms, plaster bagworms, and household case-making moths. The larva live in, feed from and pupate inside a characteristic watermelon-shaped, flattened, broadly spindle-shaped case lined internally with silk. The outside of the case is usually covered with sand, soil particles, brick dust, and other miscellaneous debris found within the larva's habitat. The genus *Phereoeca* occurs throughout the wet tropics of the Old and New World. Robinson & Nielson (1993) stated that they are aware of six *Phereoeca* spp. worldwide of which four are named. The nomenclature and taxonomy of the genus *Phereoeca* has been, and remains confusing.

Prior to this paper, the only other *Phereoeca* species recorded from North America was *Phereoeca uterella* (Walsingham) which is reported from Florida, Louisiana, Mississippi, and North Carolina (Hetrick 1957). For many years, this species was reported as *Tineola walsinghami* (Busck) (Villanueva-Jimenez 1996, Katz 1997). *Tineola walsinghami* was put in synonymy in 1984 (Davis 1984). The species in Florida was then referred to as *Phereoeca dubitatrix* (Meyrick) (Villanueva-Jimenez 1996). *Phereoeca dubitatrix* was put in synonymy in 1993 (Robinson & Nielsen 1993). The *Phereoeca* from Florida is now designated as *P. uterella* (Walsingham). The name changes associated with this single species testifies to the confusion regarding the identity and nomenclature of the genus *Phereoeca.*

Phereoeca praecox Gozmany and Vari in California.—The first report of a plaster bagworm occurring in California was on 28 January 1986 when a number of larval cases were submitted by a pest control operator to Orange County Agriculture Commissioner for identification (Nick Nisson, personal communication). Adults reared from this sample were sent to the National Museum of Natural History for identification. A species determination could not be made at that time because the specimens submitted were in poor condition preventing proper identification. Adults of a *Phereoeca* sp. captured on 2 April 1997 from inside a residence on Granville Drive, Newport Beach, Orange County, California, and additional moths reared from larval cases retrieved from the above address were

sent to Dr. Davis of the NMNH for a species determination. Davis subsequently fowarded illustrations of his genitalia dissections of this species to Gaden Robinson of the British Museum (Natural History). Robinson identified the male as *P. praecox*, but he was uncertain if the female represented the same species. *Phereoeca* specimens reared from larval cases collected on 27 August 1998 from Gardena, Los Angeles County, California, were also submitted to Davis for identification. Males from this sample were found to be consistent with *P. praecox*.

P. praecox was originally described in 1973 (Gozmany & Vari 1973). The male holotype was reported to have been taken on 30 August 1928 in Njala, Sierra Leone. *P. praecox* has since been reported from Australia (Robinson & Nielson 1993).

This paper reports the first North American and California records of *P. praecox*. Other species of *Phereoeca* are not known to occur in California.

Since 1989, I have encountered plaster bagworms in southern California associated with structures during the course of my work as a structural pest management professional. Specimens collected by the author, and others submitted to him for identification, have always been empty larval cases. Empty cases are easily recognizable because the pupal exuviae are usually found partially protruding from one end of the case. I have collected cases from inside garages, in substructural areas, under exterior stairwells, on exterior walls, under eaves of structures, on walls and ceilings of entryways, under patio covers and at patio/building junction, and on bathroom and laundry room walls. On one occasion, a case with a live larva was found on the asphalt parking lot of a commercial office building about 10 m from the structure.

Distribution Records of P. praecox in Southern California.—U.S.A. CALIFORNIA. *LOS ANGELES Co.*: Los Angeles, 26 August 1987. California Dept. of Food & Agriculture, Plant Pest Diagnostic Branch record. Los Angeles, 20 July 1996. H. Gulmahamad. Gardena, 20 January 1998, R. Arias. Redondo Beach, 27 August 1998, S. Howard. Gardena, 27 August 1998, H. Gulmahamad. Gardena, 15 October 1998. D. Jimbo. Long Beach, 30 October 1998, S. Howard. Redondo Beach, 4 November 1998, S. Howard. San Pedro, 10 November 1998, S. Howard. *ORANGE Co.*: Westminster, 28 January 1986. Nick Nisson. Anaheim, 20 March 1989. H. Gulmahamad. Aliso Viejo, 15 June 1996. V. Herrera. Newport Beach, 2 April 1997. H. Gulmahamad. Irvine, 17 May 1997. D. Kern. Placentia, 22 May 1997. R. Lagana. Yorba Linda, 30 May 1997. P. Palamara. Anaheim Hills, 12 July 1997. D. Simkin. Mission Viejo, 4 August 1997. M. Tassinari. Anaheim, 31 October 1997. H. Gulmahamad. San Clemente. 16 February 1998. D. Eschevarria. Costa Mesa, 2 March 1998. B. Griffin. Costa Mesa, 11 March 1998. B. Smallwood. Newport Beach, 4 April 1998. H. Gulmahamad. Anaheim, 1 May 1998. H. Gulmahamad. Corona del Mar, 22 July 1998. V. Lucero. Newport Beach, 23 July 1998. V. Lucero. Irvine, 16 March 1999. H. Gulmahamad. *RIVERSIDE Co.*: Beaumont, 2 April 1993. Tracy. *SAN BERNARDINO Co.*: Chino, 17 September 1997. R. Lampman. *SAN DIEGO Co.*: San Diego, 12 December 1988. R. Skelly. San Diego, 19 March 1992. Glassford. Spring Valley, 27 March 1994. Taylor. *SANTA BARBARA Co.*: Santa Barbara, 25 February 1988. CDFA Plant Pest Diagnostic Branch record. *YOLO Co.*: Sacramento, 20 April 1993. L. Allen.

Food Sources of the Genus Phereoeca.—There is much disagreement regarding natural food sources of the larvae of the various species of *Phereoeca*. Cited food sources include insect parts, fur, flannel, wool, spider webs, bat and bird droppings, and other fabrics (Meyrick 1905; Walsingham 1914; Kea 1933; Busck 1933; Watson 1939, 1946; Mallis 1954; Hinton 1956; Hetrick 1957; NPCA 1977; Zimmerman 1978; Aiello 1979; Robinson & Nielson 1993; Koehler & Castner 1994). Dissection of 15 cases of *P. praecox* containing live larvae which were taken from three different locations in southern California, revealed that *P. prae-*

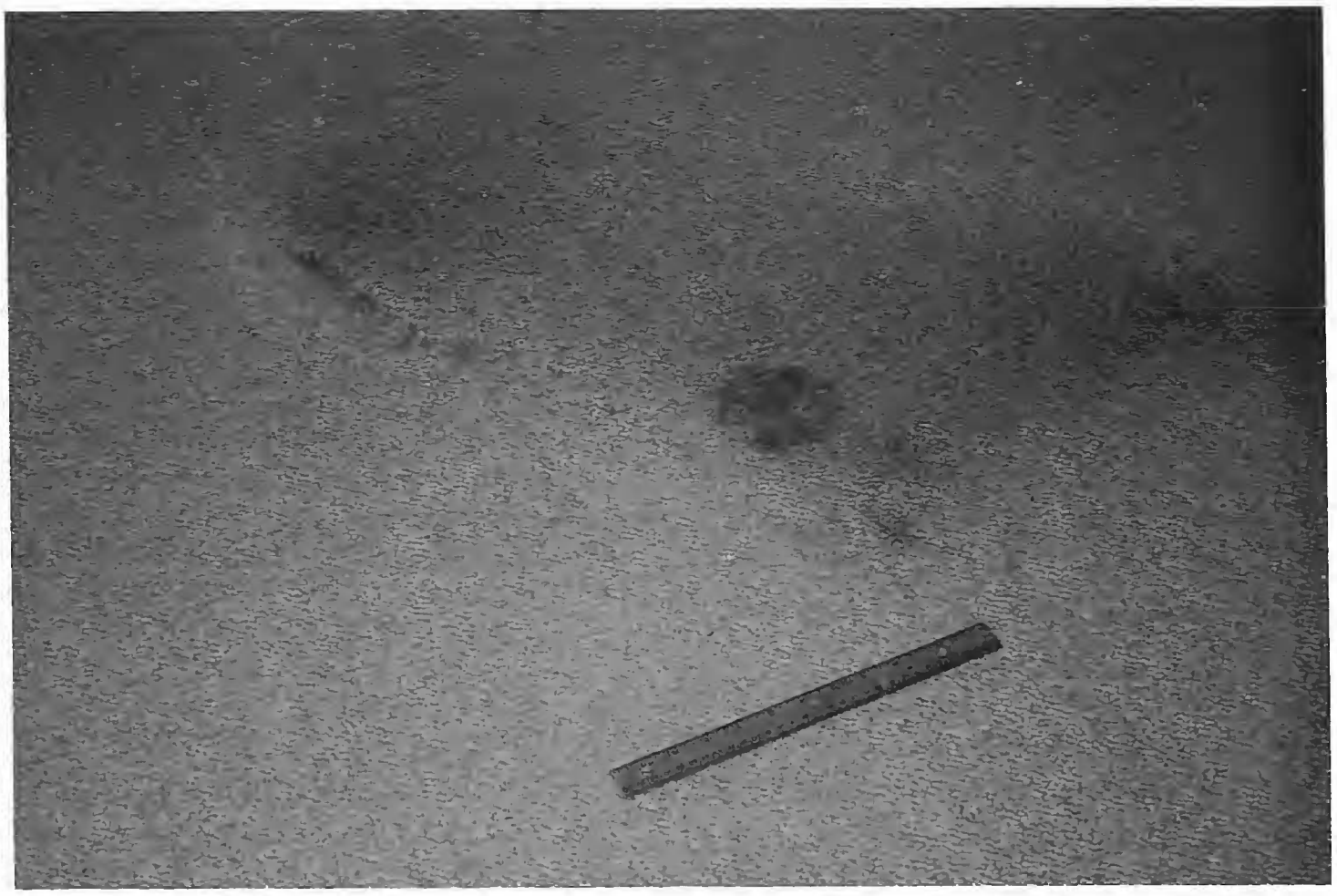

Figure 1. Top. Plaster bagworm cases hanging at wall/ceiling junction of garage. Ninety cases were counted in this area.

Figure 2. Bottom. Carpet below zebra skin rug showing plaster bagworm damage. Note more pronounced damage at periphery of rug.

Figure 3. Photograph shows damage caused by plaster bagworm to edge of carpet adjacent to a sliding glass door.

cox fed on dead insects, insect parts and fragments, human and animal hairs, and bird feathers. This is the first record of a *Phereoeca* species feeding on bird feathers.

A Case History of P. praecox as a Fabric Pest in California.—On 26 March 1997, the owner of a residence on Granville Drive, Newport Beach, Orange County, California called Terminix International and requested assistance with an unusual pest problem. On 2 April 1997, I interviewed the owner and conducted an inspection of the premises. In the detached garage, I found numerous cases of *P. praecox* on the walls and at the wall/ceiling junction. Many empty cases were hanging in spider webs at the wall/ceiling junction (Fig. 1).

The area of concern to the homeowner was a portion of the carpet in front of the fireplace which was covered with a natural zebra skin rug. The carpet was a two-year-old 100% looped wool Berber carpet portions of which under the zebra skin was eaten to the base (Fig. 2). No larval cases were present at this time. However, interviewing the maid, I discovered that, as part of her regular cleaning routine, the zebra skin rug is picked up at least once every two weeks and the area underneath it vacuumed. The maid claimed that it was during one of the these bimonthly cleaning in March 1997 that she discovered the damage and about 30 larval cases of a plaster bagworm under the rug. She maintained that the damage occurred within a two week period. Damage to the carpet was also found at several other locations in the living room, primarily at the floor/wall junction (Fig. 3). At some of these areas, empty larval cases were found under the edges of the carpet. I conducted a meticulous inspection of the premises for other fabric pests. None were found. A number of live adult moths were found in one dimly

lit corner of the living room. Additional larval cases were taken from: in and on the fireplace, in the chimney, under a sofa, under a sofa cushion, under a chair, under and behind a china cabinet, behind baseboards, under the edges of the carpet, on walls and ceilings of closets, on the living room walls particularly in corners where two walls meet. Larval cases were also found on the stucco and brick walls on the exterior of the entryway to the home. The maid claimed that, at one time, plaster bagworm cases were so numerous on the exterior walls of the entryway that she had to wash them off with a water hose.

Acknowledgment

I thank Stoy Hedges, Ken Hobbs, Don Davis, and Harry Katz for their constructive review of the manuscript, and Don Davis and Gaden Robinson for identifying the California plaster bagworm.

Literature Cited

Aiello, A. 1979. Life history and behavior of the case-bearer *Phereoeca allutella* (Lepidoptera: Tineidae). Psyche, 86: 125–136.

Busck, A. 1933. Microlepidoptera of Cuba. Entomologica Americana 13: 151–203.

Davis, D. R. 1984. Tineidae. Chapter 15. pp. 19–24. *In* Heppner, J. B. (ed.). Atlas of Neotropical Lepidoptera. Checklist. Part 1. Microterigoidea-Immoidea. W. Junk Publishers, The Hague, The Netherlands.

Gozmany, L. A. & L. Vari. 1973. The Tineidae of the Ethiopian region. Mem. Transv. Mus., 18: 1–238.

Hetrick, L. A. 1957. Some observations on the plaster bagworm, *Tineola walsinghami* Busck (Lepidoptera: Tineidae). Fla. Entomol., 40: 145–146.

Hinton, H. E. 1956. The larvae of the species of Tineidae of economic importance. Bull. Entomol. Res., 47: 251–346.

Hinton, H. E. & J. D. Bradley. 1956. Observations on species of Lepidoptera infesting stored products. XVI: two new genera of clothes moths (Tineidae). The Entomologist, 89: 42–47.

Katz, H. 1997. Clothes moths. Chapter 10. pp. 427–462. *In* Moreland, D. (ed.). Handbook of pest control. Mallis Handbook & Technical training company. Cleveland, Ohio.

Kea, J. W. 1933. Food habits of *Tineola uterella.* Fla. Entomol., 17: 66.

Koehler, P. G. & J. L. Castner. 1994. Pests that occasionally invade structures. Univ. of Florida. Institute of Food and Agricultural Sciences. Dept. of Entomology and Nematology. SP 148.

Mallis, A. 1954. Handbook of pest control (1st ed.). Mac Nair-Dorland Company, New York.

Meyrick, E. 1905. Descriptions of Indian Micro-Lepidoptera. J. Bombay Nat. History Soc., 16: 580–619.

NPCA. 1977. Fabric pests. NPCA Technical release, ESPC 031101–031141. NPCA. Dunn Loring, Virginia.

Robinson, G. S. & E. S. Nielsen. 1993. Tineid genera of Australia (Lepidoptera). Monographs of Australian Lepidoptera. Volume 2. CSIRO Publications, East Melbourne, Victoria. Australia.

Villanueva-Jimenez, J. A. 1996. Plaster bagworm *Phereoeca dubitatrix* (Meyrick) Lepidoptera: Tineidae. http://guv.ifas.ufl.edu/~insect/urban/occus/P-Bagworm.htm.

Walsingham, T. De. G. L. 1914. Family 20. Tineidae. Biologia Cent.-Am. Insecta Lepid. Heterocera, 4: 344–375.

Watson, J. R. 1939. Control of four household pests. Fla. Agr. Exp. Sta. Press Bull., 536.

Watson, J. R. 1946. Control of three household insects. Fla. Agr. Exp. Sta. Press Bull., 619.

Zimmerman, E. C. 1978. Insects of Hawaii. Volume 9. Microlepidoptera. The University Press of Hawaii, Honolulu. Hawaii.

Received 19 Nov 1998; Accepted 21 Apr 1999.